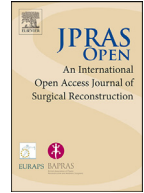




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## Case Report

## King cobra bite – Can early decompression prevent digital amputation?

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## ARTICLE INFO

## Article history:

Received 12 October 2020

Accepted 2 November 2020

Available online 17 November 2020

## Keywords:

King cobra bite

Snake bite

Finger decompression incision

Digital osteofacial comparisons

## ABSTRACT

King cobra bites are extremely rare in the western world. These bites can be fatal due to the large volume of the venom injected. We report a case of digital ischaemia from a King cobra bite in a young man who was working in a zoo in Netherlands. He was protected from systemic envenomation as he was wearing a protective glove. However, his right index finger developed subsequent gangrene and he underwent a ray amputation. The current literature on the management of snake bites to hands is reviewed and the role of early decompression discussed.

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## Introduction

King cobras are one of the largest venomous snakes in the world. They are endemic to South East Asia and can grow up to 19.2 feet in length.<sup>1</sup> There are reported cases of King cobra bites from the western world where people keep exotic snakes as pets or while handling them in reptile parks. This is a case report on a young man who sustained a King cobra bite while working in a reptile park in the Netherlands and presented to us with an ischaemic finger which was eventually amputated. The case is being reported due to its rarity of presentation and also to discuss the role of early decompressive surgery (Figs. 1–4).

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**Figure 1.** Snake bite wound on the palmar aspect of the index finger.



**Figure 2.** Blistering and cellulitis on Day 2.



**Figure 3.** Digital ischemia and skin necrosis 3–4 days following snake bite.

## Case report

A 30 years old man was referred to us from a Hospital in Netherlands with a snake bite to his right index finger as he was resident in the UK. He sustained the bite while he was handling a King cobra in a reptile park where he worked. He was wearing a special glove he invented himself to handle poisonous snakes.

He presented to our unit 5 days post injury as he stayed in another hospital for observation. He did not receive any anti-venom as he had no signs of systemic envenomation. He felt that the glove he was wearing limited the volume of venom injected into his body.

He had a bite wound over the palmar aspect of his right index finger. He took photograph of his finger which showed the finger gradually turning white over the next day and subsequently developed a purple colour (Figs. 1 and 2).

When he presented to us he had developed necrosis of the soft tissue of the finger circumferentially. He had debridement of the finger the following day resulting in a degloved finger (Figs. 3 and 4). After 2 days he eventually had a ray amputation of the finger through the metacarpal shaft. He was discharged the following day and followed up in clinic. The wound healed completely without any complications.



**Figure 4.** Ischemic soft tissue following 1st surgical debridement.

## Discussion

Poisonous snake bites in the western world mostly occur from exotic pets or in snake handlers in reptile parks. In a case series of foreign venomous snake bite in Britain, in a seven year period from 1970 to 1977, there were 17 people who suffered 32 snake bites. Of these there were three cobra bites. Two of these were life-threatening and six patients had local skin necrosis.<sup>2</sup> In a similar paper from the USA, which looked at non-native poisonous snake bites from 1977 to 1995, there were 54 consultations of which 40% were for cobra bites with one mortality.<sup>3</sup>

King cobra bites are rare as they are shy snakes that tend to avoid human contact. Most of the bites happen in countries where these snakes are endemic such as India, Southern China and Malaysia. In the rest of the world these snakes exist in captivity as pets or in reptile parks. There are only single case reports of king cobra bites from the USA and the UK and these deals with the systemic effects of the venom.<sup>4–6</sup>

Our patient was fortunate not to develop systemic envenomation which he attributed to the glove he had invented. However, he developed local toxicity and tissue necrosis in the finger which resulted in amputation.

It is well recognised that snake bite wounds result in tissue necrosis, oedema and increased intra-compartmental pressure in closed osteofascial compartments. It is recommended that surgical intervention to address this is delayed till haematological abnormalities are corrected.<sup>7,8</sup> An increase in compartment pressures in digits can cause ischaemia and irreversible tissue damage. In a series of

four cases of Japanese mamushi snake bites to the hand, Sugamata et al. performed relaxing incisions to relieve the compartment pressures to the hand and fingers in three cases. None of these three patients developed tissue necrosis or long-term sensory disturbances. A fourth patient who did not have this procedure developed skin necrosis and required skin grafting. This patient also had long term sensory disturbance. Based on this experience, the authors recommended relaxing incisions to relieve the tissue pressures and to washout the venom. These incisions were carried out within 3 h of the bite and the authors recommended that the onset of pallor and numbness were indications to perform these incisions.<sup>9</sup>

Our patient did not undergo any procedures in the initial stage of his injury. The photographs demonstrate pallor and subsequent tissue necrosis over the next few days. This raises the question as to whether an initial decompression through a mid-lateral incision or a Bruner incision may have limited the tissue necrosis.

This case is the second reported case of a King cobra bite from the United Kingdom and it is presented for its rarity of presentation and to discuss the role of initial decompression to reduce the risk of digital amputation.

### Declaration of Competing Interest

None.

### Funding

None.

### Ethical approval

N/A.

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